AF
2856

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Serial No.	:	09/911,836 Confirmation No.: 3877
Appellants	:	Andrew R. Reading, Carl D. Ensfield, Gideon (NMI) Eden, Susan (NMI) Rauschl, Timothy A. Nevius, Gerhard Wiegleb, Robert K. Zummer and Atul Shah
Filing Date	:	July 24, 2001
Group	:	2856
Examiner	:	Hezron Williams
For	:	VEHICLE GAS EMISSION SAMPLING AND ANALYSIS ASSEMBLY
Atty Docket	:	SEN01 P-338A
Customer No.	:	28101

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Attention: Board of Patent Appeals and Interferences

Dear Sir:

CERTIFICATE OF MAILING

I hereby certify that the attached Appellant's Brief on Appeal (12 pages), including cover sheet (1 page); Table of Contents (1 page); Table of Cases (1 page); and Appendix – Rejected Claims (pages i-vi); (cover sheet, Brief, Table of Contents, Table of Cases and Appendix submitted in triplicate); Appellants' Brief (37 CFR 1.192) transmittal letter (1 page); Transmittal of Appeal Brief (Patent Application - 37 CFR 1.92) (1 page, in duplicate); check in the amount of $165 for the filing fee; Petition and Fee for Extension of Time Form (1 page, in duplicate) and check in the amount of $55 for the extension fee; and return postcard are being deposited with the United States Postal Service as first class mail, postage fully prepaid, in an envelope addressed to:

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

on February 23, 2004.

Donna J. Raaymakers

Donna J. Raaymakers
Van Dyke, Gardner, Linn & Burkhart, LLP
2851 Charlevoix Drive, S.E., Suite 207
Post Office Box 888695
Grand Rapids, Michigan 49588-8695
(616) 988-4108

FSB:djr
SEN01 P-338A
Enc.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Serial No.	:	09/911,836
Appellants	:	Andrew R. Reading, Carl D. Ensfield, Gideon (NMI) Eden, Susan (NMI) Rauschl, Timothy A. Nevius, Gerhard Wiegleb, Robert K. Zummer and Atul Shah
Filing Date	:	July 24, 2001
Group	:	2856
Examiner	:	Hezron Williams
For	:	VEHICLE GAS EMISSION SAMPLING AND ANALYSIS ASSEMBLY
Atty Docket	:	SEN01 P-338A
Customer No.	:	28101

Confirmation No.: 3877

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Attention: Board of Patent Appeals and Interferences

Dear Sir:

APPELLANTS' BRIEF (37 CFR 1.192)

This Brief is in furtherance of the Notice of Appeal filed in this case on November 21, 2003. The fees required under § 1.17(c) for filing this Brief are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

This Brief is transmitted in triplicate (37 CFR 1.192(a)).

Respectfully submitted,

ANDREW R. READING ET AL.

By: Van Dyke, Gardner, Linn & Burkhart, LLP

Dated: February 23, 2004.

Frederick S. Burkhart
Registration No. 29 288
2851 Charlevoix Drive, S.E., Suite 207
Post Office Box 888695
Grand Rapids, Michigan 49588-8695
(616) 988-4104

FSB:djr
SEN01 P-338A

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Serial No.	:	09/911,836	Confirmation No.: 3877
Appellants	:	Andrew R. Reading, Carl D. Ensfield, Gideon (NMI) Eden, Susan (NMI) Rauschl, Timothy A. Nevius, Gerhard Wiegleb, Robert K. Zummer and Atul Shah	
Filing Date	:	July 24, 2001	
Group	:	2856	
Examiner	:	Hezron Williams	
For	:	VEHICLE GAS EMISSION SAMPLING AND ANALYSIS ASSEMBLY	
Atty Docket	:	SEN01 P-338A	
Customer No.	:	28101	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Attention: Board of Patent Appeals and Interferences

Dear Sir:

TRANSMITTAL OF APPEAL BRIEF (PATENT APPLICATION - 37 CFR 1.92)

Transmitted herewith in triplicate is the APPEAL BRIEF in this application with respect to the Notice of Appeal filed on November 21, 2003.

Pursuant to 37 CFR 1.17(c), the fee for filing the APPEAL BRIEF is $165.

Enclosed is a one-month extension of time to extend the due date for filing the APPEAL BRIEF to February 23, 2004. The extension fee due is $55.

Attached please find a check in the sum of $165 and a check in the sum of $55. If any additional extension and/or fee is required, this is a request therefor to charge Account No. 22-0190. A duplicate copy of this Transmittal of Appeal Brief is attached.

Respectfully submitted,

ANDREW R. READING ET AL.

By: Van Dyke, Gardner, Linn & Burkhart, LLP

Dated: February 23, 2004.

Frederick S. Burkhart.
Registration No. 29 288
2851 Charlevoix Drive, S.E., Suite 207
Post Office Box 888695
Grand Rapids, Michigan 49588-8695
(616) 988-4104

FSB:djr
SEN01 P-338A

PATENT
SEN01 P-338A

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Serial No.	:	09/911,836	Confirmation No.: 3877
Appellants	:	Andrew R. Reading, Carl D. Ensfield, Gideon (NMI) Eden, Susan (NMI) Rauschl, Timothy A. Nevius, Gerhard Wiegleb, Robert K. Zummer and Atul Shah	
Filing Date	:	July 24, 2001	
Group	:	2856	
Examiner	:	Hezron Williams	
For	:	VEHICLE GAS EMISSION SAMPLING AND ANALYSIS ASSEMBLY	
Atty Docket	:	SEN01 P-338A	
Customer No.	:	28101	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

BRIEF ON APPEAL

Respectfully submitted,

ANDREW R. READING ET AL.

By: Van Dyke, Gardner, Linn & Burkhart, LLP

Dated: February 23, 2004.

Frederick S. Burkhart
Registration No. 29 288
2851 Charlevoix Drive, S.E., Suite 207
Post Office Box 888695
Grand Rapids, Michigan 49588-8695
(616) 988-4104

FSB:djr
SEN01 P-338A

TABLE OF CONTENTS

TABLE OF CASES

PATENT
SEN01 P-338A

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Serial No.	:	09/911,836	Confirmation No.: 3877
Appellants	:	Andrew R. Reading, Carl D. Ensfield, Gideon (NMI) Eden, Susan (NMI) Rauschl, Timothy A. Nevius, Gerhard Wiegleb, Robert K. Zummer and Atul Shah	
Filing Date	:	July 24, 2001	
Group	:	2856	
Examiner	:	Hezron Williams	
For	:	VEHICLE GAS EMISSION SAMPLING AND ANALYSIS ASSEMBLY	
Atty Docket	:	SEN01 P-338A	
Customer No.	:	28101	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

BRIEF ON APPEAL

1. Real Party in Interest:

The real party in interest is Sensors, Inc.

2. Related Appeals and/or Interferences:

There are no related cases on appeal or in any interference proceedings.

3. Status of the Claims:

Claims 19-49 and 59-81 are pending in the application. Of these, claims 44-49 are withdrawn from consideration as being drawn to a non-elected invention. Claims 19-43 and 59-81 are rejected. The rejections of claims 19-43 and 59-81 are hereby appealed. No claims are indicated as being allowable.

4. Status of the Amendments:

An amendment after final rejection or appeal (37 C.F.R. 1.116) was filed on November 21, 2003. This filing presented amendments to claims 72 and 73 in order to attempt to overcome a rejection under 35 U.S.C. § 112, second paragraph. Applicants have not received confirmation that these amendments have been entered. The attached Appendix reprints claims 72 and 73 as if these amendments had been entered.

5. Summary of the Invention:

The present invention relates to a novel vehicular gas emission analyzer assembly that travels with the vehicle, which is also known as an in-flight analyzer. The gas analyzer assembly is made up of a gas analyzer system having two or more analyzer components. One of the analyzer components is operating at a particular temperature and another of the analyzer components is operating at an elevated temperature that is higher than the particular temperature. The gas analyzer system measures at least one emission parameter from an internal combustion engine. This at least one engine parameter may include concentration and/or mass of an exhaust gas and/or exhaust particulate matter. The gas emission analyzer includes a housing that is adapted to travel with the vehicle and defines at least two internal zones that are commonly enclosed by the housing. The at least two internal zones are at different operating temperatures. One of the analyzer components is in one of the internal zones and one of the other analyzer components is in another of the internal zones.

By maintaining the two or more analyzer components at respective different temperatures, the sample emission gas being analyzed is maintained at an elevated temperature in at least one analyzer component. This substantially avoids condensation of hydrocarbons while the sample flows through the respective analyzer component. By maintaining the hydrocarbons in the sample and avoiding condensation on the analyzer component, a more accurate analysis of concentration and/or mass of the exhaust gas and/or exhaust particulate matter may be obtained. These elements are in a housing that is adapted to travel with the vehicle which facilitates, for the first time, a commercially feasible in-flight vehicle gas emission analyzer.

Claim 19 calls for:

> A vehicular gas emission analyzer assembly for traveling with a vehicle, comprising:
>
> a gas analyzer system having at least two analyzer components, one of said analyzer components operating at a particular temperature and another of said analyzer components operating at an elevated temperature that is higher than said particular temperature, said gas analyzer system adapted to measure at least one emission parameter from an internal combustion engine, said at least one emission parameter chosen from (i) concentration of at least one exhaust gas, (ii) mass of at least one exhaust gas, (iii) concentration of exhaust particulate matter; and (iv) mass of exhaust particulate matter; and
>
> a housing for said gas analyzer system, said housing adapted to travel with a vehicle wherein said housing defines at least two internal zones, said at least two internal zones commonly enclosed by said housing, one of said analyzer components being in one of said internal zones and the other of said analyzer components being in another of said internal zones wherein said at least two zones being at different operating temperatures.

Claim 19 is the only independent claim in the application.

6. Issues:

1. Whether claims 19, 22-25, 27, 29, 30, 36, 39, 42, 43, 59, 61-63, 66, 68-71 and 74-78 are unpatentable under 35 U.S.C. § 103(a) as being obvious over Published International Application No. WO 99/35480 published by Breton (hereinafter referred to as "Breton1") in view of German Patent Publication No. DE 36 11 662 A published by Leistner et al. (hereinafter referred to as "Leistner").

2. Whether claims 64, 65, 79 and 80 are unpatentable under 35 U.S.C. § 103(a) as being unpatentable over Breton1/Leistner as applied to claim 19 and in view of United States Patent No. 6,560,545 B2 issued to Stedman et al. (hereinafter referred to as "Stedman").

3. Whether claims 28 and 38 are unpatentable under 35 U.S.C. § 103(a) as being unpatentable over Breton1/Leistner as applied to claim 19 and in view of European Patent Application No. EP 0 880 022 A2 issued to Tripathi et al. (hereinafter referred to as "Tripathi").

4. Whether claims 37, 40 and 41 are unpatentable under 35 U.S.C. § 103(a) over Breton1/Leistner as applied to claim 19 and in view of European Patent Application No. EP 1 176 412 A2 issued to Ensfield et al. [*sic* Reading et al.] (hereinafter referred to as "Reading").

5. Whether claims 24, 26 and 27 are unpatentable over 35 U.S.C. § 103(a) over Breton1/Leistner as applied to claim 23 and in view of United States Patent No. 6,148,656 issued to Breton (hereinafter referred to as "Breton2").

6. Whether claims 31-33, 35 and 67 are unpatentable under 35 U.S.C. § 103(a) over Breton1/Leistner as applied to claim 29 and in view of United States Patent No. 5,753,185 issued to Mathews et al. (hereinafter referred to as "Mathews").

7. Whether claim 34 is unpatentable under 35 U.S.C. § 103(a) over Breton1/Leistner/Mathews as applied to claim 31 and in view of United States Patent No. 5,201,219 issued to Bandurski et al. (hereinafter referred to as "Bandurski").

8. Whether claims 60, 62 and 63 are unpatentable under 35 U.S.C. § 112, second paragraph, as being indefinite.

7. Grouping of Claims:

For the purpose of this appeal, claims 19-28, 36, 38, 39, 42, 43, 59, 60, 64, 65, 79 and 80 shall stand or fall together separate from the other claims. Claims 37, 40 and 41 shall stand or fall together separate from the other claims. Claims 29-35 shall stand or fall together separate from the other claims. Claims 61-78 and 81 shall stand or fall together separate from the other claims. It will be understood that these groupings of claims are being chosen for the purpose of expediting this appeal, but, in no way, should be construed as an admission that Applicants do not consider one or more of the individual claims in these groups to be separately patentable from any other claim in the same group.

8. Arguments:

I. Whether claims 19, 22-25, 27, 29, 30, 36, 39, 42, 43, 59, 61-63, 66, 68-71 and 74-78 are unpatentable under 35 U.S.C. § 103(a) as being obvious over Published International Application No. WO 99/35480 published by Breton (hereinafter referred to as "Breton1") in view of German Patent Publication No. DE 36 11 662 A published by Leistner et al. (hereinafter referred to as "Leistner").

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation either in the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify the reference or combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference or references when combined must teach or suggest all of the claimed limitations. The teaching or suggestion to make the claimed combination a reasonable expectation of success must both be found in the prior art and not based on Applicants' disclosure. In re Vaeck, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). See M.P.E.P. § 2143.

Breton1 is directed to an on-board vehicle emission testing system (see Abstract). The Breton1 system includes an instrument module adapted to be detachably connected to the exhaust pipe of a vehicle to provide for flow of exhaust gas therethrough. The instrument module includes a differential pressure probe which allows for the determination of flow rate of the exhaust gas and a gas sampling tube for continuously feeding a sample of the exhaust gas to a gas analyzer. The Breton1 gas analyzer is disclosed to be a commercially available unit marketed by Sun/Snap-on under Model MT-3505 portable emission analyzer. The Office Action recognizes that Breton1 does not disclose at least two internal zones commonly enclosed by a housing, the at least two internal zones being at different operating temperatures. However, the Office Action takes the position that Leistner teaches two zones of different temperature and that it would have been obvious to one of ordinary skill in the art to use Leistner's heating arrangement in Breton1 because the "gases must be maintained above the dew point."

Leistner is directed to gas-preparation lines in a cabinet. The lines are connected between gas-analyzing measuring equipment and gas-extraction probes delivering measured gas to the gas preparation lines. The gas-extraction probes are flue-gas connectors that are

disclosed for use with DENOX and Flue-gas desulfurization plants (see translation, page 5, lines 1-15). The gas-preparation lines are in a portable cabinet and include such elements as inlet valves, filters, flow pumps, motors, pressure reducers and intermediate feedback conduits (see Abstract). The gas-analyzing measuring equipment includes an NH_3 measuring device, designated by circuit symbol 41 in Fig. 2. The NH_3 measuring device is external to the portable cabinet (translation page 16, lines 22-27). The portable cabinet is divided into a first large compartment, shown at the top of Fig. 1, which is heated to 75° C and another compartment shown at the bottom of Fig. 1 that is maintained at a temperature of between 5° C and 10° C.

Even if the references are combined, the combined teaching of the references fails to disclose, teach or suggest one analyzer component, as defined in claim 19, being in one internal zone and another analyzer component being in another of the internal zones, wherein the at least two zones are at different operating temperatures. The Office Action recognizes that Breton1 fails to disclose, teach or suggest two zones at different temperatures. The only analyzer component mentioned in Leistner, namely, the NH-3 measuring device, is external to the cabinet. The only devices within the two compartments in Leistner are gas preparation elements, such as inlet valves, filters, flow pumps, and the like, which are not analyzer components as defined in the claims. Accordingly, even if the references are combined in the manner suggested in the Office Action, the combined references would suggest at most an on-board vehicle emission testing system having two compartments, the first compartment heated to 70° C and the second compartment heated to 5° C to 10° C with elements, such as inlet valves, filters, flow pumps, and the like, in a first compartment, flowmeters in the other compartment and the analyzer component external of both of the compartments. Indeed, because Leistner discloses that the analyzer component is *external* to the cabinet, Leistner teaches away from the invention as defined in claim 19. Accordingly, even if there would be a motivation to combine the prior art references, they do not teach or suggest all of the claimed limitations.

It is further submitted that there is no suggestion or motivation either in the references themselves or in the knowledge generally available to one of ordinary skill in the art to combine the reference teachings. Breton1 is directed to an on-board vehicle emission testing system. Leistner is directed to a flue-gas analyzer for DENOX and flue-gas desulfurization plants. It is submitted that the skilled artisan would not consult a patent directed to DENOX and flue-gas desulfurization plants to modify a vehicle emission testing system. Moreover, it

is submitted that the references teach away from the combination as claimed in claim 1. In particular, it is submitted that Leistner teaches that the analyzer component is to be external to the cabinet, not in one of the two components. Accordingly, rather than suggesting one analyzer compartment in one internal zone defined by the housing and another analyzer component in another internal zone defined by the housing, the references teach away from the combination or modification. Nor would there be any likelihood of success in the combination. There is nothing in the prior art to suggest that providing Breton1 with the heated gas preparation cabinet of Leistner would provide the result achieved by the invention as defined in claim 19. For all of these reasons, it is submitted that the Examiner has failed to establish a *prima facie* case of obviousness.

Claim 61 is dependent on and further modifies claim 19. Claim 61 specifies that the housing, which is adapted to travel with a vehicle, is substantially moisture impervious in order to be resistant to environmental elements. Claim 69, which is dependent on and further modifies claim 19, specifies that the housing, which is adapted to travel with a vehicle, has an aspect ratio that is greater than or equal to two (2). Claim 81, which is dependent on and further modifies claim 19, specifies that the housing, which is adapted to travel with the vehicle is adapted to mounting at an external portion of a vehicle body.

In rejecting the claims, the Office Action does not make reference to any particular disclosure in the prior art. Rather, the Office Action dismisses these claims with statements such as "most housings are moisture impervious," . . . "it would have been obvious to one of ordinary skill in the art at the time of the invention to choose an aspect ratio and shape that fits the geometry of the situation," . . . "it would have been obvious to one of ordinary skill in the art at the time of the invention to shock mount any sensitive vehicle analyzer." The Office Action fails to recognize that it is the present application, not the prior art, which teaches a housing for a gas analyzer system having gas analyzer components that is adapted to travel with a vehicle. Therefore, it is impermissible to assume that the skilled artisan would know to use such a housing for a vehicle gas emission analyzer assembly, much less modify the housing in the manner suggested by the Office Action. As previously set forth, Leistner is not directed to an on-board vehicle emission testing system. In Breton1, only the exhaust gas flowmeter 10 is shown to be in a special housing. There is no special housing in Breton1 for the gas analyzer having gas analyzer components. It is only the present application, which is not prior art to itself, which teaches a housing for a gas analyzer system having gas analyzer components that is adapted to travel with a vehicle and which is substantially moisture impervious (claim 61), has an aspect ratio that is greater than or equal

to 2 (claim 69), and is adapted to mounting at an external portion of a vehicle body (claim 81).

Claim 29 is dependent on claim 19 and calls for at least one of the at least two analyzer components comprising a heated device for measuring concentration of hydrocarbon, the heated device being at a temperature sufficiently high to reduce the deposit of hydrocarbon materials on the heated device. The application discloses that, by reducing the deposition of hydrocarbon molecules present in the sample gas upon inner surfaces of the heated devices, loss of hydrocarbon gas is reduced and the accuracy of measurement is increased. In Leistner, the gas-analyzing measuring equipment is outside of the cabinet and is not heated, much less heated to a temperature sufficiently high to reduce the deposit of hydrocarbon gas. Any alleged suggestion in Leistner that "gases must be maintained above the dew point," as set forth in the Office Action, is irrelevant. The invention as defined in claim 29 achieves the result of a more accurate measurement of the hydrocarbon by reducing deposition of hydrocarbon materials. This is particularly important for long-chain hydrocarbons present in certain fuels, such as diesel fuel. Claims 30-35 are dependent on claim 29.

Accordingly, Applicants respectfully urge that claims 19, 22-25, 27, 29, 30, 36, 39, 42, 43, 59, 61-63, 66, 68-71 and 74-78 are patentably distinguishable over Breton1 in view of Leistner or any other reference of record.

II. Whether claims 64, 65, 79 and 80 are unpatentable under 35 U.S.C. § 103(a) as being unpatentable over Breton1/Leistner as applied to claim 19 and in view of United States Patent No. 6,560,545 B2 issued to Stedman et al. (hereinafter referred to as "Stedman").

Claims 64, 65, 79 and 80 are grouped with claim 19, which was discussed above. These claims were further rejected over Stedman. These claims are all dependent on claim 19 as a base claim and call for a communication channel for communicating data from at least one gas detector to a system outside of the housing. It is submitted that Stedman does not make up for that which is lacking in the primary references. Stedman does not disclose one analyzer component operating at a particular temperature and another analyzer component operating at an elevated temperature that is higher than the particular temperature nor a housing that is adapted to travel with the vehicle that defines at least two internal zones with one of the analyzer components being one of the internal zones and the other of the

analyzer components being in the other of the different zones, wherein the at least two zones are at different operating temperatures. Accordingly, Applicants respectfully urge that claims 64, 65, 79 and 80 are patentably distinguishable over Breton1 in view of Leistner and in view of Stedman or any other reference of record.

III. Whether claims 28 and 38 are unpatentable under 35 U.S.C. § 103(a) as being unpatentable over Breton1/Leistner as applied to claim 19 and in view of European Patent Application No. EP 0 880 022 A2 issued to Tripathi et al. (hereinafter referred to as "Tripathi").

Claims 28 and 38 are grouped with claim 19 which is discussed above. Claims 28 and 38 are dependent on claim 19 as a base claim and call for one of the at least two analyzer components comprising a heated device for measuring concentration of hydrocarbon at a temperature sufficiently high to reduce the deposit of hydrocarbon materials on the heated device (claim 28) and one of the at least two analyzer components comprising at least one device for measuring NO_x which operates substantially without supplemental cooling of the exhaust gas wherein the device for measuring NO_x utilizes a heating zirconia detector (claim 38). In Tripathi, the zirconium dioxide sensor is not disclosed in combination with a housing adapted to travel with the vehicle which defines at least two internal zones, the at least two zones being at different operating temperatures. Tripathi discloses a stationary system for testing a vehicle positioned on a dynamometer. It is submitted that there is no motivation for the combination, and Tripathi does not make up for that which is missing from the primary references. Accordingly, Applicants respectfully urge that claims 28 and 38 are patentably distinguishable over Breton1/Leistner and in view of Tripathi or any other reference of record.

IV. Whether claims 37, 40 and 41 are unpatentable under 35 U.S.C. § 103(a) over Breton1/Leistner as applied to claim 19 and in view of European Patent Application No. EP 1 176 412 A2 issued to Ensfield et al. [sic Reading et al.] (hereinafter referred to as "Reading").

The rejection of these claims was based, in part, on European Patent No. EP 1 176 412 to Ensfield et al. [*sic* Reading et al.]. This rejection is improper. Reading et al. is the European equivalent of the present application and claims priority from the same

United States provisional applications as does the present application. Accordingly, Reading et al. is not a reference to the present application. Because this rejection was based on Reading et al., it is improper.

Claims 37, 40 and 41 are dependent on claim 19 as a base claim and incorporate by reference all of the limitations thereof. Applicants respectfully urge that claims 37, 40 and 41 are patentably distinguishable over Breton1 in view of Leistner or any other reference of record.

V. Whether claims 24, 26 and 27 are unpatentable over 35 U.S.C. § 103(a) over Breton1/Leistner as applied to claim 23 and in view of United States Patent No. 6,148,656 issued to Breton (hereinafter referred to as "Breton2").

Claim 24 calls for a heated line connecting the probe with the housing. Claims 26 and 27 specify that the gas analyzer system operates at a temperature that is at or above the dew point of the vehicle exhaust. Breton2 claims priority from the same provisional application as Breton1 and appears to have the same disclosure as Breton1. Accordingly, it is submitted that Breton2 does not add to the disclosure in Breton1. Claims 24, 26 and 27 are all dependent on claim 19 as a base claim and thereby incorporate by reference all of the limitations of claim 19. Accordingly, Applicants respectfully urge that claims 24, 26 and 27 are patentably distinguishable over Breton1 in view of Leistner, in view of Breton2 or any other reference of record.

VI. Whether claims 31-33, 35 and 67 are unpatentable under 35 U.S.C. § 103(a) over Breton1/Leistner as applied to claim 29 and in view of United States Patent No. 5,753,185 issued to Mathews et al. (hereinafter referred to as "Mathews").

Dependent claim 31, which is dependent on and further modifies claim 29, specifies that the heated device comprises a flame ionization device. This claim is further rejected over Mathews. While Mathews discloses a flame ionization analysis, it is submitted that the skilled artisan would not be motivated to provide such a device in an internal compartment of a housing for a gas analyzer system that is adapted to travel with a vehicle. Moreover, it is submitted that even if the combination is made, the claim limitations are not all met.

Claim 35 calls for the gas analyzer being adapted to compression-ignition engines. Claim 35 is dependent on claim 19 as a base claim and incorporates by reference all of the

limitations thereof. It is submitted that Mathews fails to make up for that which is missing in the primary references. In particular, Mathews does not disclose a gas analyzer system having at least two analyzer components, one of the analyzer components operating at a particular temperature and another of the analyzer components operating at an elevated temperature that is higher than the particular temperature. Nor does Mathews disclose a housing for a gas analyzer system that is adapted to travel with a vehicle. Accordingly, Applicants respectfully urge that claims 31-33, 35 and 67 are patentably distinguishable over Breton1 in view of Leistner, in view of Mathews or any other reference of record.

VII. Whether claim 34 is unpatentable under 35 U.S.C. § 103(a) over Breton1/Leistner/Mathews as applied to claim 31 and in view of United States Patent No. 5,201,219 issued to Bandurski et al. (hereinafter referred to as "Bandurski").

Claim 34, which is dependent on and further modifies claim 31, specifies that the device is for measuring concentration of hydrocarbon and heated to a temperature at or above 175° C. This claim is further rejected over Bandurski. Bandurski is directed to locating hydrocarbon source rock or other strata. It is submitted that Bandurski is not analogous art and would not be considered by the skilled artisan to modify the other references. Accordingly, Applicants respectfully urge that claim 34 is patentably distinguishable over Breton1 in view of Leistner, in view of Bandurski or any other reference of record.

VIII. Whether claims 60, 72 and 73 are unpatentable under 35 U.S.C. § 112, second paragraph, as being indefinite.

It is fundamental that Applicants are entitled to claim what they consider to be their invention as long as it is reasonably understood by the skilled artisan. Claim 60 is dependent on claim 19 as a base claim and calls for the at least two internal zones being open to each other. The specification discloses on page 14, lines 12-16, that:

> areas 13 and 36 may be separated from each other by a dividing wall or may be open to each other. Either way, areas, or zones, 34, 36 have a substantially consistent temperature . . .

It is submitted that one of ordinary skill in the art would readily be able to design a system with areas that are open to each other, but maintained at different operating temperatures. The skilled artisan would know, by way of example, that airflow and

separation distance, to name but two techniques, could be used to accomplish this result. Accordingly, it is submitted that claim 60 meets the requirements of 35 U.S.C. § 112, second paragraph.

Claims 72 and 73 were amended by the amendment after final rejection or appeal. Claim 72 is dependent on claim 69 and calls for the measured parameters of the vehicle engine being combined with an output of the gas analyzer system. Claim 73 is dependent on claim 72 and calls for the measured parameters being combined with the output of the gas analyzer system in a serial data stream. Without acquiescing in the rejection, it is submitted that claims 72 and 73 fully comply with 35 U.S.C. § 112, second paragraph. Accordingly, Applicants respectfully submit that claims 60, 72 and 73 are patentable under 35 U.S.C. § 112, second paragraph.

9. Conclusion:

For the reasons advanced above, Applicants respectfully contend that each of the appealed claims is patentable. Therefore, reversal of all of the rejections of the claims is respectfully solicited.

Respectfully submitted,

ANDREW R. READING ET AL.

By: Van Dyke, Gardner, Linn & Burkhart, LLP

Dated: February 23, 2004.

Frederick S. Burkhart
Registration No. 29 288
2851 Charlevoix Drive, S.E., Suite 207
Post Office Box 888695
Grand Rapids, Michigan 49588-8695
(616) 988-4104

FSB:djr
SEN01 P-338A

APPENDIX

REJECTED CLAIMS

Claims 19-43 and 59-81.

19. A vehicular gas emission analyzer assembly for traveling with a vehicle, comprising:

a gas analyzer system having at least two analyzer components, one of said analyzer components operating at a particular temperature and another of said analyzer components operating at an elevated temperature that is higher than said particular temperature, said gas analyzer system adapted to measure at least one emission parameter from an internal combustion engine, said at least one emission parameter chosen from (i) concentration of at least one exhaust gas, (ii) mass of at least one exhaust gas, (iii) concentration of exhaust particulate matter; and (iv) mass of exhaust particulate matter; and

a housing for said gas analyzer system, said housing adapted to travel with a vehicle wherein said housing defines at least two internal zones, said at least two internal zones commonly enclosed by said housing, one of said analyzer components being in one of said internal zones and the other of said analyzer components being in another of said internal zones wherein said at least two zones being at different operating temperatures.

20. The analyzer assembly in claim 19 for calculating the mass of said at least one exhaust gas in grams per each mile driven by the vehicle.

21. The analyzer assembly in claim 19 wherein each of said internal zones has a substantially consistent temperature in a direction of the housing and wherein said zones vary in temperature from each other in another direction of the housing.

22. The analyzer assembly in claim 19 including a volumetric flow meter adapted to be attached to an exhaust tailpipe of the vehicle and wherein said mass is determined by resolving said measured concentration and volumetric exhaust gas flow measured by said volumetric flow meter.

23. The analyzer assembly in claim 19 including a probe adapted to withdraw exhaust from a vehicle tailpipe.

24. The analyzer assembly in claim 23 including a heated line connecting said probe with said housing.

25. The analyzer assembly in claim 19 wherein said gas analyzer system operates substantially uninfluenced by supplemental cooling.

26. The analyzer assembly in claim 19 wherein said gas analyzer system operates at a temperature that is at or above the dew point of the vehicle exhaust gas.

27. The analyzer assembly in claim 26 wherein said gas analyzer system further includes calculating means for compensating said emission parameter for the effect of humidity present in said exhaust gas.

28. The analyzer assembly in claim 26 wherein one of said at least two analyzer components comprises a heated device for measuring concentration of hydrocarbon, said heated device at a temperature sufficiently high to reduce the deposit of hydrocarbon materials on said heated device.

29. The analyzer assembly in claim 19 wherein one of said at least two analyzer components comprises a heated device for measuring concentration of hydrocarbon, said heated device at a temperature sufficiently high to reduce the deposit of hydrocarbon materials on said heated device.

30. The analyzer assembly in claim 29 wherein said heated device comprises an infrared-based gas concentration reader.

31. The analyzer assembly in claim 29 wherein said heated device comprises a flame ionization device.

32. The analyzer assembly in claim 29 wherein said device for measuring concentration of hydrocarbon is heated to a temperature at or above 60 degrees centigrade.

33. The analyzer assembly in claim 32 wherein said gas analyzer is adapted to spark-ignition engines.

34. The analyzer assembly in claim 31 wherein said device for measuring concentration of hydrocarbon is heated to a temperature at or above 175 degrees centigrade.

35. The analyzer assembly in claim 34 wherein said gas analyzer is adapted to compression-ignition engines.

36. The analyzer assembly in claim 19 wherein one of said at least two analyzer components comprises at least one device for measuring NO_x which operates substantially without supplemental cooling of said exhaust gas.

37. The analyzer assembly in claim 36 wherein said device for measuring NO_x utilizes ultraviolet detection techniques.

38. The analyzer assembly in claim 36 wherein said device for measuring NO_x utilizes a heated zirconia detector.

39. The analyzer assembly in claim 36 wherein said device for measuring NO_x utilizes an electrochemical cell.

40. The analyzer assembly in claim 19 wherein one of said at least two analyzer components comprises at least one device for measuring NO_x which utilizes ultraviolet detection techniques.

41. The analyzer assembly in claim 40 wherein said gas analyzer includes an ultraviolet discharge lamp.

42. The analyzer assembly in claim 19 wherein one of said at least two analyzer components comprises at least one gas detector to measure the concentration of at least one gas emitted from the engine, at least one pump to draw gas from the engine and at least one gas channel linking between said at least one detector and said at least one pump.

43. The analyzer assembly in claim 19 wherein one of said at least two analyzer components is chosen from (i) a non-dispersive infrared analyzer, (ii) a Fourier transform infrared analyzer, (iii) an ultraviolet analyzer, (iv) a mass spectrometer, (v) a mass analyzer comprising an electromechanical oscillator holding a substrate onto which particulate matter can accumulate, and (vi) a mass analyzer comprising a filter substrate onto which particulate matter can accumulate.

59. The analyzer assembly in claim 19 wherein said at least two internal zones are separated by at least one dividing wall.

60. The analyzer assembly in claim 19 wherein said at least two internal zones are opened to each other.

61. The analyzer assembly in claim 19, said housing being substantially moisture impervious in order to be resistant to environmental elements.

62. The analyzer assembly in claim 61 wherein said housing is adapted to mounting at an external portion of a vehicle body.

63. The analyzer assembly in claim 61 wherein said housing has a length and a width, said length and width of said housing defining an aspect ratio, wherein said aspect ratio is greater than or equal to two (2).

64. The analyzer assembly in claim 61 including a communication channel for communicating data from said at least one gas detector to a system outside of said housing.

65. The analyzer assembly in claim 64 wherein said communication channel is a wireless communication channel.

66. The analyzer assembly in claim 61 including vibration dampers to reduce vibration of components defining said gas analyzer system.

67. The analyzer assembly in claim 61 wherein said gas analyzer system comprises one of a gasoline engine analyzer and a diesel engine analyzer.

68. The analyzer assembly in claim 61 wherein one of said at least two analyzer components comprises at least one gas analyzer chosen from (i) a non-dispersive infrared analyzer, (ii) a Fourier transform infrared analyzer, (iii) an ultraviolet analyzer, (iv) a mass spectrometer, (v) a mass analyzer comprising an electromechanical oscillator holding a substrate onto which particulate matter can accumulate, and (vi) a mass analyzer comprising a filter substrate onto which particulate matter can accumulate.

69. The analyzer assembly in claim 19, said housing having a length and a width, a ratio of said length to said width defining an aspect ratio of said housing, wherein said aspect ratio of said housing is greater than or equal to two (2).

70. The analyzer assembly in claim 69 wherein said housing is substantially in the form of a cylinder.

71. The analyzer assembly in claim 70 wherein said housing is substantially in the form a circular cylinder.

72. The analyzer assembly in claim 69 wherein at least one vehicle engine parameter is combined with an output of said gas analyzer system to determine a parameter of vehicle gas emission.

73. The analyzer assembly in claim 72 wherein at least one vehicle engine parameter is combined with said output of said gas analyzer system in a serial data stream.

74. The analyzer assembly in claim 69 including means for measuring flow rate of the emissions of the vehicle.

75. The analyzer assembly in claim 74 wherein said means for measuring flow rate comprises a flow meter.

76. The analyzer assembly in claim 69 wherein said housing has an aerodynamic shape.

77. The analyzer assembly in claim 69 wherein said housing is substantially moisture impervious in order to be resistant to environmental elements.

78. The analyzer assembly in claim 69 wherein one of said at least two analyzer components is chosen from (i) a non-dispersive infrared analyzer, (ii) a Fourier transform infrared analyzer, (iii) an ultraviolet analyzer, (iv) a mass spectrometer, (v) a mass analyzer comprising an electromechanical oscillator holding a substrate onto which particulate matter can accumulate, and (vi) a mass analyzer comprising a filter substrate onto which particulate matter can accumulate.

79. The analyzer assembly in claim 19 including a communication channel for communicating data from said at least one detector to a system outside of said housing.

80. The analyzer assembly in claim 79 wherein said communication channel is a wireless communication channel.

81. The analyzer assembly in claim 19 wherein said housing is adapted to mounting at an external portion of a vehicle body.